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ABSTRACT

This study examines the opinions of elementary school teachers currently employed by the Greeneville City School System regarding the utilization and effects of educational technology in the elementary classroom. The System has committed to building and maintaining a state-of-the-art computer network for students served by the district. A large financial commitment was also made with the purchase of an individualized curriculum delivery system called CCC (Computer Curriculum Corporation) SuccessMaker. This study attempts to determine if the educational technology program was making a positive impact on student achievement, and if there were other benefits being realized, such as increased student self-esteem and improved behavior among students utilizing the computer network. Sixty-four surveys completed by elementary teachers in the System were used in the data analysis. A large majority of teachers had very positive attitudes regarding the educational technology program in the System. Most teachers reported improved test scores, better behavior among students actively engaged with technology, and increased self-esteem and self-confidence among many students involved with the educational technology program. One area of concern that was identified was the need for additional teacher training in the area of managing technology in a classroom with 5 computers and 20 or more students. Survey cover letter and survey are appended. (Author/AEF)

OPINIONS OF TEACHERS REGARDING THE EFFECTS
OF EDUCATIONAL TECHNOLOGY IN THE
ELEMENTARY CLASSROOM

By

Beverly Sue Warren Miller

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of the Requirements for the Degree of

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OPINIONS OF TEACHERS REGARDING THE EFFECTS OF EDUCATIONAL TECHNOLOGY IN THE ELEMENTARY CLASSROOM

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BSOM 258

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ABSTRACT

This study examined the opinions of elementary school teachers, currently employed by the Greeneville City School System, regarding the utilization and effects of educational technology in the elementary classroom. The System has made a tremendous commitment to building and maintaining a state-of-the-art computer network for the students served by the district. A large financial commitment was also made with the purchase of an individualized curriculum delivery system called CCC (Computer Curriculum Corporation) SuccessMaker. This study attempted to determine if the educational technology program was making a positive impact on student achievement. This study also attempted to determine if there were other benefits being realized such as increased student self-esteem and improved behavior among students utilizing the computer network.

A survey instrument developed by the researcher measured the variables. The survey was mailed to the entire elementary teacher population in the System. Eighty-four surveys were distributed and 68 were returned to the researcher for a total response rate of 81%. Four surveys were deemed unusable because not all questions were completed. Therefore, 64 surveys were used in the data analysis.

A great majority of teachers had very positive attitudes regarding the educational technology program in the System. Most teachers reported improved test scores, better behavior among students actively engaged with technology, and increased self-esteem and self-confidence among many students involved with the educational technology program. One area of concern that was identified was the issue of teacher training.

Conclusions drawn from the data analysis indicated a vast need for additional teacher training in the area of managing technology in a classroom with five computers and 20 or more students. The implications of this study are clear to the System administration, school board, and community. The educational technology program has been a tremendous success so far, and it should continue to grow and flourish as long as the commitment of the system educators and important funding entities are maintained.

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CHAPTER 1

Introduction

This research study examined the opinions of elementary school teachers regarding the utilization of computer technology in the elementary classrooms of the Greeneville City School System. Computers are rapidly changing the lives of Americans and others throughout the world. In order to prepare future generations for the technology-rich future, educators must constantly strive to provide enriching, hands-on learning types of activities that challenge and invigorate young learners. Computers offer one way to accomplish this goal and also offer students the opportunity to become technology literate while mastering academic goals simultaneously. This study addressed the various ways in which educators are using technology in the elementary classrooms to improve student achievement and to build student self-esteem. The issue of assessment was also investigated in an effort to determine how school districts are evaluating the success of educational technology programs. Another area addressed was the issue of classroom management and student behavior in a technology-rich classroom environment.

Background

Computers have become a daily part of the lives of American citizens. Ordinary tasks such as banking and grocery shopping have evolved into technological challenges, and even fueling one's car has become an automated event. Many daily activities that previously required

a trip to a store or bank may now be accomplished in the privacy and comfort of one's home via the use of a personal computer with a simple modem connected to an ordinary telephone line. Libraries have become increasingly automated, and patrons now must possess some computer literacy in order to research topics and check out materials. The personal computer evolution has been responsible for much of the extensive automation that now exists in our everyday lives. The price of personal computers has decreased significantly in recent years; thus it has become increasingly affordable and feasible for the average person to own and operate a home computer system.

As a result of this technological trend, public education entities are putting more emphasis on educating students regarding the use of computers. But more importantly, schools are beginning to use computers as important tools that have been proven effective in helping children to master certain academic skills. The great technological divide that existed just a few years ago between the affluent and the poor school districts is becoming more equalized as federal and state funding opportunities are making it possible for all schools to own and maintain computer networks. In fact, technology is being utilized to bring children of various socioeconomic backgrounds together in order to share ideas and experiences. Horn (1996) stated, "The intent is to create a virtual classroom that cuts through racial, economic, and geographical barriers" (p. 454).

Technology education has evolved over the years and is constantly changing as new software and hardware become available. Many teachers find themselves faced with the difficult task of adding yet another subject area consisting of computer instruction to an already heavy class schedule. Michael Milone (1998a) stressed the importance of carefully integrating the technology into an existing curriculum. If educators can find an instructional technique that

utilizes the computer as a tool to accomplish the learning objectives, the need for the additional subject area of computer instruction will disappear.

Educational technology should support and extend learning. However, many times it seems to serve as an obstacle. In many cases, teachers feel inadequately trained to use computers and do not feel comfortable teaching technological skills to students. Milone (1998b) stated, "Outstanding technology programs seem effortless" (p. 6). Students have a strong base set of computer skills and can apply them effectively to accomplish an assigned task. Teachers use technology assertively and effectively to demonstrate concepts and to make assignments which require the use of computers to complete. Technology is not only changing the physical appearance of the classroom, but also the methods used by teachers to help students learn.

Elementary schools in the Greeneville City School System are strong supporters of computer technology. Each academic classroom in all four schools has a minimum of five Pentium class networked computers, a color printer, a 27" color television with scan converter, and a laser disk player. Every computer has filtered and monitored Internet access and all staff members have email accounts. A significant monetary investment was made three years ago to implement an individualized curriculum delivery system called Computer Curriculum Corporation (CCC). CCC provides a tool for teachers to be able to provide individual personalized instruction to every child in his or her classroom. Each child progresses through a process called initial placement motion (IPM). CCC uses a computer algorithm to constantly monitor a student's progress, and the program provides more or less challenging material based on the student's performance. Teachers have instant access to student and class records by utilizing customizable reports.

Statement of the Problem

Obviously, the Greeneville City School System has made a substantial investment in order to provide students with access to current computer technology. CCC has now been in place for three years, and many teachers use it every day as part of their instruction time. Much evidence exists to prove that the effects of technology have been positive for the elementary students. The evidence includes higher student standardized test scores, lower absenteeism, and decreased retention numbers. However, teachers' opinions about the software and the tremendous commitment overall to computerized instruction has not been actively sought. This study attempted to enlighten those involved with the educational technology program for the Greeneville City School System about the opinions of educators charged with the enormous task of preparing children for the technologically challenging 21st century.

Significance of Study

Teachers of elementary school children face many challenges during the course of a day. One challenge is how to effectively manage and utilize computer technology as an integrated tool. If teachers' opinions about the effects of technology in the elementary classroom are known, the school system will be able to use the data to improve the educational technology program. Improvement of the educational technology program will ultimately provide a positive effect upon the number one goal of the Greeneville City School System. That goal is student achievement.

Limitations

The results obtained from this study only directly apply to the teachers within the Greeneville City School System. Although the results could be compared to other small school systems in the same region, direct comparisons should not be made.

Review of Literature

Approaching a new century is an exciting event for a society. However, unless the society is made up of members who are well prepared to survive and compete in the new period, many challenges and uncertainties will surely arise. The competitive global economy puts a premium on a well-educated workforce. The recent virtual explosion in scientific research and information has caused our society to re-evaluate how we teach our children. Molnar (1997) stated, "The two major functions of education are to transmit the culture, values and lessons of the past to the current generation; and to prepare our children for the world in which they will live" (p. 63). In order to prepare our children appropriately, computer technology must be incorporated into the school day beginning at the elementary level.

Research conducted by Gardner, Simmons, and Simpson (1992) proved that the use of computers in education is very beneficial and is often more effective and efficient than traditional teaching methods typically used in elementary classrooms. Their research examined a program using "Weatherschool" meteorology software that was aimed at determining the combined effect of computer-aided instruction (CAI) and hands-on training in the learning process of elementary school students. While former research had proven that hands-on activities helped children to master certain skills, the researchers found that a combination of hands-on activities and CAI was even more effective.

Elementary classrooms of today are significantly different from those that existed only a few years ago. Computers now have a special place in many rooms including those in the Greeneville City School System. Teachers and students alike rely on computers to accomplish certain tasks on a daily basis. Many other school systems are also relying heavily on computer networks in order to orchestrate learning. Muhammad (1998) wrote about the vast changes that have taken place in elementary schools during the explosion of the personal computer evolution. He described entering a third-grade classroom and being impressed by the state-of-the-art technology that was being independently operated by very young students. He stated, "That's when it hits you—this is not the third-grade classroom you remember. It's a training ground for the leaders of the Digital Age" (p. 72).

There are many challenges that accompany this new technological explosion into the academic world. Many teachers do not feel adequately trained in the use of computers. Therefore, some educators hesitate to incorporate the technology into their existing curriculum. Lack of support staff often prevents teachers from being able to utilize a small number of computers in a classroom. In a class of twenty students, five computers can be difficult to manage. Thus, non-traditional teaching methods must accompany the plan to utilize technology if it is to be effective. The traditional role of the teacher as the dispenser of knowledge is being replaced by the role of the teacher as a facilitator of knowledge. He or she is now responsible for making sure that students know how to research a given topic and that students become discerning processors of the vast amount of knowledge that is available. NEA Today stressed that children must be taught how to use the Internet for research, but they need help in evaluating the material after they have it in their hands ("Technology Takes Teamwork," 1999). Research conducted by Schroeter (1998) indicated that students become more motivated to compose

written work when utilizing a computer. They do not seem to mind the revision process quite as much when they are able to make their changes via a few strokes on the computer keyboard.

Educational computing programs offer many benefits, including those seen at Willow Bend School in Rolling Meadows, IL (Conyers, Kappel & Rooney, 1999). Many concrete results of its technology program include improved test scores, increased student excitement, and renewed staff enthusiasm. Another example of a successful technology program can be found in Texas by examining the San Antonio Independent School District (Alfaro, 1999). They decided to study the impact of computer technology in providing quality education for all schools. They utilized a computerized reading program that targeted students in kindergarten up to first and second grade. The program proved very effective in teaching pre-reading skills.

Public education has historically been the target of blame for poor readers and non-readers in society. The truth is that not all children begin at the same level or progress at the same pace. Nevertheless, in a traditional school setting, all children are instructed at the same pace and in the same fashion. Horn (1996) stated, "Some students come to school with as little as 300 hours of early language experience, while others arrive with as many as 3,000 hours. The former need all the help they can get" (p. 454). Computers allow teachers to be creative and to provide more individualized instruction to students. Specialized software is designed to assist those children lacking in language skills and allow them to catch up to their peers (Muckle & Wishart, 1999). By utilizing computers, teachers are able to combine the teaching of two skills into one lesson. Students are fascinated and intrigued by reading electronic books. Teachers can capitalize on such student enthusiasm by utilizing electronic books to foster a love of reading among the students that they teach.

In addition to reading, mathematics is another important subject area in which students must possess a set of basic skills in order to function in society. Teachers and administrators at Jefferson Elementary School in Redford, Michigan developed a plan to integrate technology into the math curriculum (Brun, 1997). They viewed the challenge as a way to form the foundation of the age-old mathematics skills while also developing a group of technology smart students. They set up the "Jefferson Math Lab," which featured computers and software to teach specific subjects such as geometry, fractions, and measurement. Incorporated into this innovative project was a specially designed curriculum dedicated to mathematical pursuits including critical thinking, cooperative problem solving, and meaningful concept development. Every class in the K-5 school utilizes the math lab at least one hour each week. Teachers also use the lab in various ways including preparing lessons, communicating electronically, and downloading lesson plans. Staff development has also been an important part of the project. Each teacher is expected to attend regular classes in order to continue to build his or her set of computer skills. Various test data prove that the math lab is meeting an important need and that students are achieving math success.

Many researchers believe that a strong indicator of success for elementary students is the factor of parental involvement. Students with parents who are genuinely interested and involved in classroom activities and learning experiences tend to do better in school both from an academic as well as a social aspect. Susan Brooks (1998) stated, "Recognizing that student performance improves when parents are actively involved in the education of their children, the teaching staff at Cogswell Elementary School in El Monte, California, has set about to find creative ways of including family members" (p. 18). One way the educators were able to accomplish the goal was to include computer technology in their programs. The teaching staff

developed a program designed to benefit both children and adult learners. By teaching computer courses during the day to traditional students and then offering similar classes for parents after normal working hours, the teachers were able to pull a community of learners together. Parents were encouraged to use a word processing application to design and write specialized books for their children to read. The program, called Family Home Reading, was an instant success and most children whose parents had attended were reading by the time they left kindergarten. Teachers also noticed a vast improvement in the reading comprehension skills of the siblings of the children involved in the program. Brooks also noted that parents and community members began to realize the importance of educational technology programs and became more supportive. Parent volunteers became plentiful and expanded the program beyond the original scope. Expansion plans now include outreach programs for a local community center and a specialized program for seniors and retirees.

Parental support is very important to the success of an educational technology program. Many parents seem to be doing an excellent job at ensuring their children have access to a computer at home. According to the New York Times, a recent America Online survey of 10,000 parents revealed that 2,500 children were using the computer by age two (Slatalla, 1999). Many parents indicated a significant preference for computer software interaction versus the passive activity of watching television. Therefore, many software companies are catering to this new market and are responding with many animated, graphical, interactive programs which parents and teachers are buying in great quantities.

One of the greatest challenges of teaching in the field of public education is helping students to build and maintain self-confidence and self-esteem. Many students do not feel successful in whole group instruction environments where the instructor teaches to the entire

group as if they were all performing at the same level. In reality, all students performing at the same level is not common in an elementary classroom situation. Computer-aided instruction is a very private way for a student to work at his or her own pace and to progress at a rate that is appropriate for him or her. According to Bremer and Rauch's (1998) research, the Internet and other computer-aid instruction activities can help children develop social skills and improve their self-esteem. Such computer activities as on-line chatting can be beneficial ways to build communication skills without the face-to-face factor that can sometimes be intimidating to the socially immature child.

Another controversial issue surrounding many educational technology programs is the form of assessment used to evaluate and critique the success or failure of such programs. A growing concentration on assessment among many public education administrators is partially responsible for this trend. Public education entities are being held accountable by the population they serve. Government officials, parents, and other members of the community want to see the results of the financial support committed to expensive technology initiatives. According to Kim Carter (1998), an ideal assessment program provides two important elements: evaluation and inquiry. Evaluation involves proving or disproving something, while inquiry is simply an exploration that usually leads to additional questions. An ideal assessment program contains elements of both. While standardized tests provide a certain level of proof that educational technology is successful in improving student achievement, many tests are designed to measure a specific set of academic skills that might not be the focus of technology rich activities. Many teachers feel that students are exiting the public education system without the fundamental real-world skills necessary to be successful in college or in a job. Many such skills are technology related. With the growing emphasis on computer literacy in the business world, schools must

strive to do a better job in preparing students to be successful in that environment. According to an article published by the National Education Association ("Where's the Proof," 1996), "With educational technology, students are more prepared to enter the modern business world" (p. 25).

As the challenges of educating today's youth increase along with the complexity of the technological advancements being made each and every day, school systems must continue striving to provide a quality education for all children. System goals and objectives should be tailored around a plan that will allow all students to be successful. Educational technology programs can play an important role in such a plan. However, there are improvements to be made in the ways in which technology is implemented. Teachers must be well prepared and understand the equipment and software enough to convey it to the students. There must be quality software available for students to be given individualized instructional opportunities. School board members and administrators must be willing to listen to teachers and to give them the necessary tools and training they need to do their jobs. Parents must become more involved in the education of their children and must assume much of the responsibility for making sure their children are technologically prepared. Home computer systems must be available for children to use after school in order to conduct research and perform homework assignments. These and other challenges and opportunities await our public education system as we leap into an exciting new century that will certainly be intimidating for the technologically illiterate

Research Questions

The literature addressed many of the benefits, concerns, and challenges of educational technology programs in elementary schools. Most referenced sources seemed to project an overall positive view of computer technology education at the elementary level. However, some

basic problems remain. They include the issues of teacher training, proper assessment tools to use when evaluating programs, and the measurement of the effects of technology on student behaviors and self-worth. While this study concentrated on the Greeneville City School System elementary schools and teachers, research materials proved that similar attitudes and concerns exist in other systems as well. Therefore, the study was aimed to answer the following research questions:

1. Do elementary school students exhibit increased learning and achievement as a result of utilizing educational technology in the classroom?
2. Do elementary school students benefit from educational technology in ways other than academic achievement such as increased self-esteem and self-confidence?
3. Do teachers in the Greeneville City School System receive adequate computer training in order to be prepared to functionally utilize technology in their classrooms?

CHAPTER 2

Methods

Research Design

The design method of this study was descriptive. The survey instrument was designed to gather opinions of elementary teachers in the Greeneville City School System regarding the importance and effectiveness of educational technology in the elementary classrooms. The research was done in a quantitative manner. Information gathered was analyzed so possible inferences could be made about the entire elementary school teacher population.

Population

The population in this study was the elementary school teachers in the Greeneville City School System. The school system is located in Eastern Tennessee and is one of two systems serving the students of Greene County, Tennessee. The system has an enrollment of 2,600 students in kindergarten through grade twelve in the 1999-2000 academic year. The population of elementary teachers consists of 84 elementary teachers. The population is made up of both academic and related arts teachers.

The Greeneville City School System takes pride in the employment of a highly skilled, dedicated group of employees, each with a strong desire to see all students succeed. The system is comprised of both in-zone students as well as tuition students who make up one-third of the

entire student population. The Greeneville City Schools System has traditionally been a regional leader in the area of student test scores, promotion rates, and overall student successes.

Sample Method

The sample for the project included all elementary teachers currently employed by the Greeneville City School System. All academic teachers, as well as related arts teachers including Music and Art instructors, were included in the survey. The sample used included the entire population consisting of 84 elementary teachers.

Survey Distribution

The surveys used for the project were distributed through inter-office mailboxes located at the George Clem Administrative Offices at 312 Floral Street in Greeneville, Tennessee. This method was the most effective in order to reach all elementary teachers. Surveys were distributed to elementary teachers on August 30, 1999. Teachers participating in the survey were asked to return the surveys to the researcher no later than September 10, 1999.

Survey Collection

The surveys were collected by two methods. On the survey, teachers were instructed to: (a) mail the surveys directly to the researcher, or (b) send the surveys back through the inter-office mail that is picked up and delivered twice each day. These two methods were chosen because they were practical and presented easy and inexpensive ways for teachers to return the surveys.

Threats to Validity

The threats to validity were primarily a result of the nature of the survey. Teachers might be intimidated to admit they did not feel adequately trained to use technology when many training opportunities have been made available to them. Also, since educational technology has been the focus of such a strong commitment in the Greeneville City School System, some teachers may have seen this as an attempt to obtain information regarding its usage in their classroom that may be used against them. It was assumed that teachers would respond to these questions in a truthful manner.

A pilot test was given to five elementary teachers. The teachers were asked to fill out the survey and provide feedback regarding the clarity and the validity of the instrument. The information received back from the pilot test was then evaluated. The survey was then proven to be clear and valid.

Description of Survey

The survey began with an introduction. The researcher was introduced and comments were made on the nature of the project including the fact that the research was a requirement for the completion of the Bachelor of Science Degree in Applied Organizational Management from Tusculum College. Since the instrument was being sent to educators, the graduation requirement was important to mention because most teachers are very understanding of these types of prerequisites. The survey was very clear in conveying the fact that the research information would not be available in raw data form to anyone other than the researcher.

Teachers were asked to circle their years of teaching experience and number of years teaching in the Greeneville City School System. They were also asked to specify the grade level

at which they were currently teaching. These determinants were used to investigate the various levels of teaching experience and grade levels represented among the respondents.

Instructions were then listed on how to rank the ten statements on the survey. The statements were arranged on a Likert scale. Statements could be ranked from a 1 which indicated strongly disagree, to a 5 which indicated strongly agree.

Research Question 1. Do elementary school students exhibit increased learning and achievement as a result of utilizing educational technology in the classroom? Survey Statements 1 through 5 were related to Research Question 1.

Survey Statement 1. Educational technology has had a positive influence on my instructional methods. This statement was included in order to establish the overall opinion of the educator concerning computer technology.

Survey Statement 2. My students enjoy using the classroom computers. This statement was positioned on the survey in order to determine the opinion of the educators concerning the students' feelings about the computers.

Survey Statement 3. The computers and the CCC SuccessMaker software have been valuable tools in providing more individualized instruction opportunities for my students. This statement was listed in order to gain the input of educators concerning the effectiveness of the specific hardware and software in use by the Greeneville City School System.

Survey Statement 4. I have had a difficult time managing technology with only five computers in my classroom. This survey statement was posed in order to determine if teachers were having a difficult time in utilizing non-traditional teaching methods in order to properly integrate technology into the curriculum.

Survey Statement 5. I have students who have become more successful as a result of the availability of educational technology in my classroom. This statement is listed on the survey to seek the input of educators regarding the issue of student achievement success. All students deserve a chance to be successful. Many do not achieve success in the strictly traditional classroom setting.

Research Question 2. Do elementary school students benefit from educational technology in ways other than academic achievement such as increased self-esteem and self-confidence? Survey Statements 6 through 8 were related to Research Question 2.

Survey Statement 6. I have fewer behavior problems among my students while they are actively involved on the computers. This statement was listed in order to determine what (if any) correlation existed between improved student behavior and the utilization of computer technology in the classroom.

Survey Statement 7. I have seen students gain greater self-confidence and self-esteem as a result of utilizing computer technology in my classroom. This statement was placed on the survey instrument to gather subjective information concerning the educators' opinions about student self-worth improvements when using technology to deliver the curriculum.

Survey Statement 8. My students' test scores have improved as a result of utilizing the computers to deliver individual lessons. This statement was included to seek the input of educators concerning the subject of assessment and the success or failure of the educational technology program where student achievement is concerned.

Research Question 3. Do teachers in the Greeneville City School System receive adequate computer training in order to be prepared to functionally utilize technology in their classrooms? Survey Statements 9 and 10 were related to Research Question 3.

Survey Statement 9. I feel that I have received adequate training in the area of educational technology implementation in order to use it effectively in my classroom. This statement was important in order to gather the information concerning proper teacher preparation for technology integration.

Survey Statement 10. I feel there are adequate assessment instruments in place in order to measure how well we are using computer technology in our system. This statement was placed on the survey in order to determine how teachers feel about current assessment means. Teachers need to know if programs and concepts being applied in their classrooms are making a positive difference for their students. If proper assessment tools are not in place, teachers cannot make changes to facilitate better utilization of the technology. The last part of the survey listed instructions for returning the survey to the researcher via inter-office mail or via the U.S. Postal Service along with a specific deadline for returning the form.

Evaluation of Data

After collecting the surveys, several methods of evaluation were used to adequately analyze the data. The ten statements were scored using a Likert scale method. The information gathered was evaluated by the following methods: mean, mode, percentage, and range.

The results of each survey were recorded, analyzed, and plotted on graphs from charts generated in Microsoft Excel. After carefully reviewing the results of the survey, conclusions were made from the information gathered.

CHAPTER 3

Results

Introduction

This research project surveyed elementary school teachers currently employed by the Greeneville City School System in Greeneville, Tennessee. The data collected for the project were collected by a ten statement survey, which also included three demographic questions. The surveys were sent via the Greeneville City School System's inter-office mail system. The results of the survey are presented in this chapter.

Response Rates and Respondents

The entire population of elementary school teachers currently employed by the Greeneville City School System was included in the survey. A total of 84 surveys were sent out via the inter-office mail system. Sixty-eight surveys were returned to the researcher for a total response rate of 81%. Four surveys were discarded because all questions were not completed on the survey instrument. Sixty-four surveys were used for analysis.

Three questions were asked to determine the grade levels represented by the teachers responding, the number of years of teaching experience at the elementary level, and the number of years teaching experience in the Greeneville City School System. Survey respondents included teachers who represented grade levels from kindergarten through fifth grade. Forty

percent of the respondents were currently teaching at the primary level, which includes grades kindergarten through second grade. Thirty-five percent were teaching at the intermediate grade level, which includes grades three through five. The other 25% of the respondents were teachers who were currently teaching students in all elementary grades including kindergarten through fifth grade. See Figure 1.

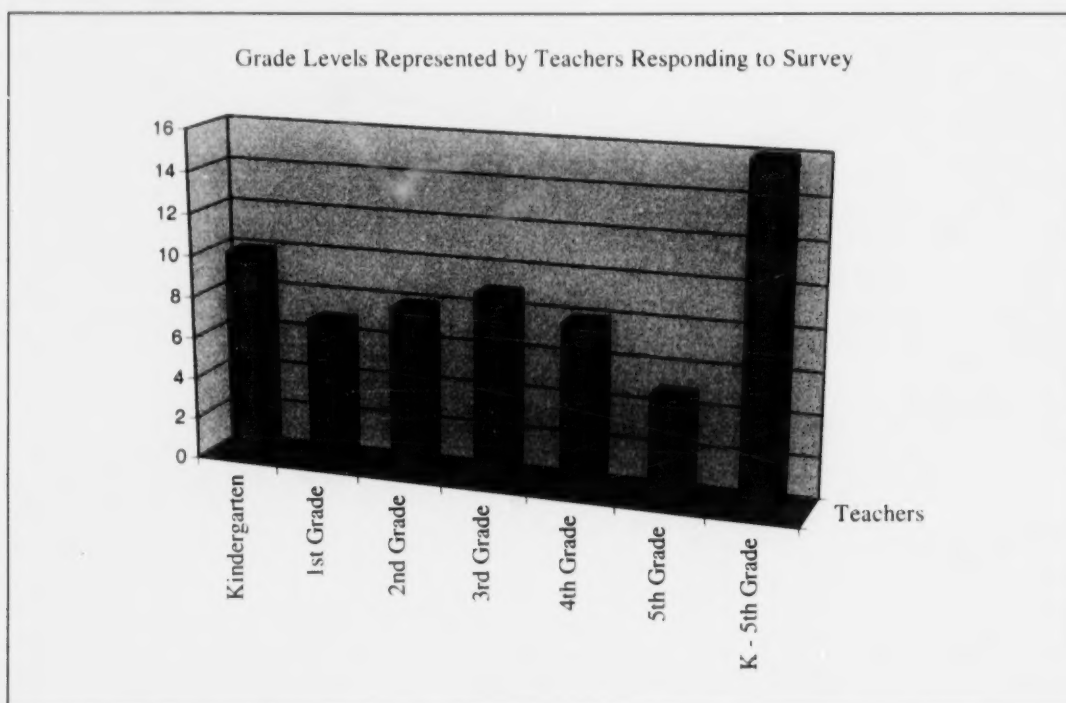


Figure 1. Grade levels represented by survey respondents. (N=64)

Twenty percent of the responding teachers had between zero to five years elementary teaching experience, 27% had between six to ten years elementary teaching experience, 22% had between 11 and 20 years elementary teaching experience, and 31% had more than 20 years elementary teaching experience. Twenty percent of the respondents had between zero to five years teaching experience in the Greeneville City School System, 28% had between six to ten years teaching experience in the Greeneville City School System, 24% had between 11 and 20

years teaching experience in the Greenville City School System, and 28% had been teaching in the Greenville City School System for more than 20 years. See Figure 2.

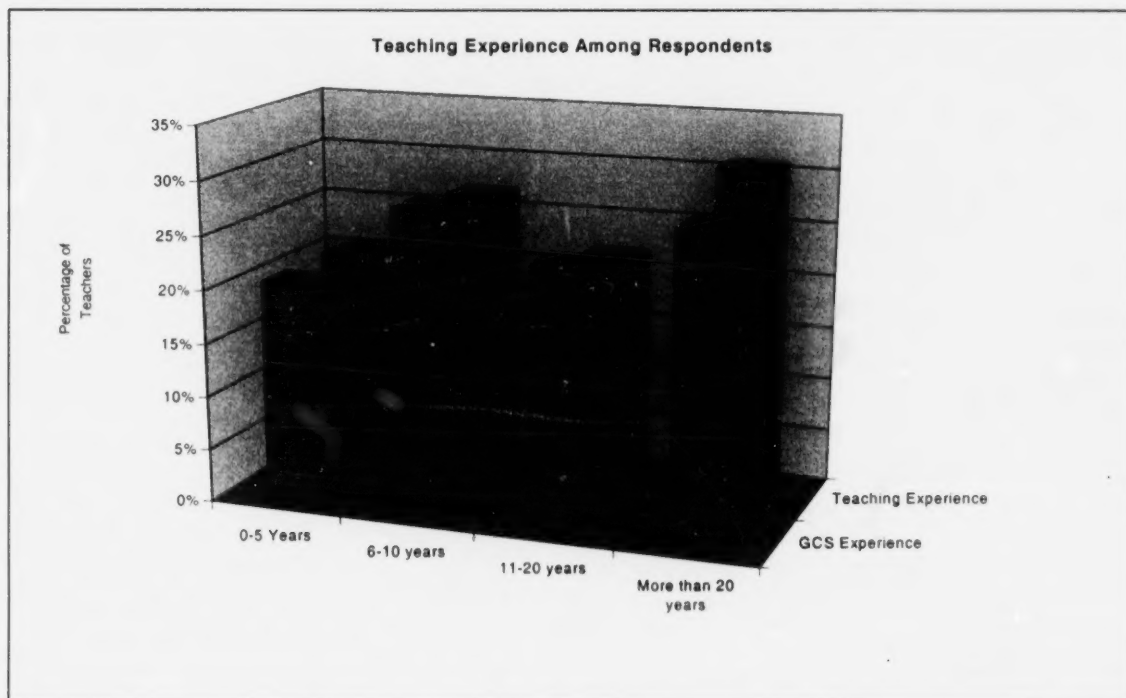


Figure 2. Number of years of teaching experience among respondents. (N=64)

Analysis of the Data

The following information was obtained from data collected through survey statements (see Appendix A). The three research questions along with corresponding survey statements are listed below.

Research Question 1. Do elementary school students exhibit increased learning and achievement as a result of utilizing educational technology in the classroom? Survey Statements 1 through 5 were related to Research Question 1. The results of Survey Statements 1 through 5 can be viewed in Table 1.

Survey Statement 1. Educational technology has had a positive influence on my instructional methods. Most teachers (56%) strongly agreed that the computer technology available in their classroom had been responsible for positive changes in their instructional methods, 38% agreed, 6% were neutral, and no teachers disagreed. The total percentage of teachers who either strongly agreed or agreed was 94%.

Survey Statement 2. My students enjoy using the classroom computers. The majority (69%) of teachers strongly agreed that their students do enjoy working on the classroom computers, 28% agreed, 1.5% were neutral, no teachers disagreed, and 1 teacher (1.5%) strongly disagreed. Again, an overwhelming 97% of teachers surveyed either strongly agreed or agreed to this statement.

Survey Statement 3. The computers and the CCC SuccessMaker software have been valuable tools in providing more individualized instruction opportunities for my students. Fifty percent of teachers who responded to the survey strongly agreed with this statement, 38% agreed, 12% were neutral, and no teachers disagreed or strongly disagreed with this statement. A total of 88% of teachers who responded to the survey either strongly agreed or agreed with this statement.

Survey Statement 4. I have had a difficult time managing technology with only five computers in my classroom. Forty percent of responding teachers agreed that they had experienced difficulties utilizing technology appropriately with only five computers, 20% strongly agreed, 17% were neutral, 20% disagreed, and 3% strongly disagreed. Sixty percent of respondents either strongly agreed or agreed with this statement.

Survey Statement 5. I have students who have become more successful as a result of the availability of educational technology in my classroom. Almost half (49%) of teachers who

responded to the survey agreed with this statement, 25% strongly agreed, 23% were neutral, 1.5% disagreed, and 1.5% strongly disagreed. Seventy-four percent of respondents either strongly agreed or agreed with this statement.

Table 1

Response to Survey Statements 1 Through 5: Relative to Research Question 1

Statement	Frequency (Percent)				
	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
Positive influence	36 (56%)	24 (38%)	4 (6%)	0 (0%)	0 (0%)
Students enjoy	44 (69%)	18 (28%)	1 (1.5%)	0 (0%)	1 (1.5%)
Individual instruction	32 (50%)	24 (38%)	8 (12%)	0 (0%)	0 (0%)
Difficulty managing	13 (20%)	25 (40%)	11 (17%)	13 (20%)	2 (3%)
Successful students	16 (25%)	31 (49%)	15 (23%)	1 (1.5%)	1 (1.5%)

Research Question 2. Do elementary school students benefit from educational technology in ways other than academic achievement such as increased self-esteem and self-confidence? Survey Statements 6 through 8 were related to Research Question 2. The results of Survey Statements 6 through 8 can be viewed in Table 2.

Survey Statement 6. I have fewer behavior problems among my students while they are actively involved on the computers. Thirty-eight percent of respondents agreed with this statement, 30% strongly agreed, 26% were neutral, 6% disagreed, and no respondents strongly

disagreed. The total percentage of teachers that either strongly agreed or agreed with this statement was 68%.

Survey Statement 7. I have seen students gain greater self-confidence and self-esteem as a result of utilizing computer technology in my classroom. Forty-eight percent of respondents agreed with this statement, 28% strongly agreed, 19% were neutral, 5% disagreed, and no respondents strongly disagreed. The total percentage of teachers that either strongly agreed or agreed with this statement was 76%.

Survey Statement 8. My students' test scores have improved as a result of utilizing the computers to deliver individual lessons. Forty-eight percent of teachers agreed with this statement, 13% strongly agreed, 39% were neutral, and no teacher disagreed or strongly disagreed. The total percentage of teachers that either strongly agreed or agreed with this statement was 61%.

Table 2

Response to Survey Statements 6 Through 8: Relative to Research Question 2

Statement	Frequency (Percent)				
	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
Better behavior	19 (30%)	24 (38%)	17 (26%)	4 (6%)	0 (0%)
Greater self-esteem	18 (28%)	31 (48%)	12 (19%)	3 (5%)	0 (0%)
Higher test scores	8 (13%)	31 (48%)	25 (39%)	0 (0%)	0 (0%)

Research Question 3. Do teachers in the Greeneville City School System receive adequate computer training in order to be prepared to functionally utilize technology in their classrooms? Survey Statements 9 and 10 were related to Research Question 3. The results of Survey Statements 9 and 10 can be viewed in Table 3.

Survey Statement 9. I feel I have received adequate training in the area of educational technology implementation in order to use it effectively in my classroom. Fifty-nine percent of respondents agreed with this statement, 27% strongly agreed, 9.5% were neutral, 3% disagreed, and 1.5 % strongly disagreed. The total percentage of respondents who either strongly agreed or agreed with this statement was 86%.

Survey Statement 10. I feel there are adequate assessment instruments in place in order to measure how well we are using computer technology in our system. Forty-eight percent of respondents agreed with this statement, 25% strongly agreed, 23% were neutral, 3% disagreed, and no respondent strongly disagreed with this statement. The total percentage of respondents who either strongly agreed or agreed with this statement was 73%.

Table 3

Response to Survey Statements 9 and 10: Relative to Research Question 3

Statement	Frequency (Percent)				
	Strongly Agree 5	Agree 4	Neutral 3	Disagree 2	Strongly Disagree 1
Adequate training	17 (27%)	38 (59%)	6 (9.5%)	2 (3%)	1 (1.5%)
Adequate assessment	16 (25%)	31 (48%)	15 (23%)	2 (3%)	0 (0%)

CHAPTER 4

Discussion

Summary of Major Findings

The results of the survey conducted during this research project were enlightening. The respondents were overwhelmingly supportive of educational technology, and the majority of teachers that responded reported that the utilization of computers in the classroom had been responsible for profoundly positive effects upon their students. There was one concern identified. Teachers appeared to be struggling with the issue of managing educational technology effectively in a classroom with 5 computers and twenty or more students. The following section of this paper will address each research question and survey statement, and conclusions and recommendations will be presented based upon the survey results.

Discussion and Conclusions

Ten survey statements were presented on the questionnaire. Respondents were asked to rate the statements on the Likert Scale of 1 to 5, with a rating of 1 which indicated a response of strongly agree, and a rating of 5 which indicated a response of strongly disagree. Teachers who responded to the survey were very positive about educational technology and its utilization in the Greeneville City School System.

Research Question 1. Do elementary school students exhibit increased learning and achievement as a result of utilizing educational technology in the classroom? Survey Statements 1 through 5 were related to Research Question 1.

Survey Statement 1. Educational technology has had a positive influence on my instructional methods. The conclusions drawn from Survey Statement 1 revealed an extremely positive viewpoint among educators about the positive effects of computer technology upon their instructional methods. A large percentage (94%) indicated either strong agreement or agreement to this statement. These results agreed with research conducted by Milone (1998b), which indicated that teachers who were most successful with true technology integration were those educators who modified their instructional methods to incorporate the computers and to enhance the existing curriculum. The fact that teachers perceived these changes as positive was an indication of their opinions of educational technology in general.

Survey Statement 2. My students enjoy using the classroom computers. This statement was presented in order to gain an understanding of teachers' perceptions about students' attitudes about the computers in the classrooms. Again, an overwhelming 97% of respondents either strongly agreed or agreed with this statement. This perceived positive attitude among students was another subjective indication of a successful technology program.

Survey Statement 3. The computers and the CCC SuccessMaker software have been valuable tools in providing more individualized instruction opportunities for my students. Eighty-eight percent of respondents either strongly agreed or agreed with this statement. Van Horn (1996) stressed the importance of individualized instructional software in a quality technology program. The conclusions drawn from Survey Statement 3 indicated that individualized curriculum delivery was very important to teachers.

Survey Statement 4. I have had a difficult time managing technology with only five computers in my classroom. Sixty percent of respondents either strongly agreed or agreed with this statement. Although many teachers have been successful in modifying their instructional methods as was revealed by the responses to Survey Statement 1, the responses to Survey Statement 4 do indicate that most educators continue to struggle with the concept of effectively managing 20 students with only five computers. According to Milone (1998a), teachers must concentrate on organizing their instruction very well in order to master a classroom with 20 students with only four or five computers. A centers-based approach, in contrast to whole-group instruction, was the focus of an extensive research project in which Mr. Milone concluded that even though educational technology can be challenging to implement in a classroom, the benefits make it worthwhile to pursue.

Survey Statement 5. I have students who have become more successful as a result of the availability of educational technology in my classroom. Seventy-four percent of teachers surveyed either strongly agreed or agreed with this statement. This indicated that educational technology had been responsible for helping many students find an area in which they could excel. The conclusions drawn from the responses to Survey Statement 5 were supported by research conducted by Mary Brun (1997). She concluded that in many cases, educational technology has been proven to help students master various concepts and facts that they were otherwise struggling with in the traditional academic setting.

According to the responses to Survey Statements 1 through 5, elementary school students do indeed exhibit increased learning and achievement as a result of utilizing educational technology in the classroom. Teachers were extremely supportive of educational technology, and they exhibited a positive attitude concerning computers in the classroom. They were convinced

that educational technology had been responsible for helping their students achieve academic success.

Research Question 2. Do elementary school students benefit from educational technology in ways other than academic achievement such as increased self-esteem and self-confidence?

Survey Statements 6 through 8 were related to Research Question 2.

Survey Statement 6. I have fewer behavior problems among my students while they are actively involved on the computers. Again, a majority (68%) of respondents either strongly agreed or agreed with this statement. The conclusions drawn from Survey Statement 6 responses were also supported by the responses to Survey Statement 2 which determined that students are genuinely interested in and enjoy using classroom computers. Teachers reported that educational technology had the potential to capture the attention of students and to maintain that attention span, which positively affected student behavior in many cases. Twenty-seven percent of respondents were neutral on this statement. This indicated that these teachers had not made the association between the utilization of educational technology and improved behavior among the students, even though it may have been a factor.

Survey Statement 7. I have seen students gain greater self-confidence and self-esteem as a result of utilizing computer technology in my classroom. Seventy-six percent of respondents either strongly agreed or agreed with this statement, while 19% were neutral. Once again, these results presented further evidence of the positive attitude that exists among teachers and students regarding educational technology. The conclusions drawn from Survey Statement 7 responses were supported by Adele Schroeter (1998). She observed a group of elementary students participating in a writing assignment. They were using word processing software to accomplish their goal of producing a report on a favorite subject. Schroeter reported a great sense of

accomplishment and self-esteem among the students when they were able to turn in the finished product of an attractive report.

Survey Statement 8. My students' test scores have improved as a result of utilizing the computers to deliver individual lessons. Sixty-one percent of respondents either strongly agreed or agreed with this statement. Conclusions drawn from the responses to this statement indicated that standardized test scores increased after the implementation of an educational technology program. Research (as cited in Molnar, 1997) conducted by James Kulik at the University of Michigan supported these findings. Molnar stated, "He (Kulik) found that computer-based education can increase scores from 10 to 20 percentile points and reduce time necessary to achieve goals by one-third" (p. 15).

Responses to Survey Statements 6 through 8 proved that students were receiving benefits from educational technology in areas other than academic achievement. Teachers were convinced that their students had developed greater self-confidence and self-esteem as a result of using computers in the course of the school day.

Research Question 3. Do teachers in the Greeneville City School System receive adequate computer training in order to be prepared to functionally utilize technology in their classrooms? Survey Statements 9 and 10 were related to Research Question 3.

Survey Statement 9. I feel that I have received adequate training in the area of educational technology implementation in order to use it effectively in my classroom. Eighty-six percent of the respondents either strongly agreed or agreed with this statement. Conclusions drawn from the responses to Survey Statement 9 indicated that teachers felt comfortable with the level of computer training they had received. However, responses to Survey Statement 4 indicated a great need for additional teacher training in the area of classroom management. In

order to overcome the struggles that many educators are experiencing in the area of effectively utilizing five computers in a classroom of 20 or more students, training opportunities are clearly needed.

Survey Statement 10. I feel there are adequate assessment instruments in place in order to measure how well we are using computer technology in our system. Seventy-three percent of the respondents either strongly agreed or agreed with this statement. According to Kim Carter (1998), school districts must use two important tools to properly assess educational technology programs. The two tools suggested by Carter were evaluation and inquiry. She stated, "Evaluation and inquiry are distinctly different approaches to assessment; evaluation is based on proving or disproving something, while inquiry is an exploration that leads to other questions" (p. 32). Conclusions drawn by the responses to Survey Statement 10 indicated that teachers thought the Greeneville City School System was doing an adequate job in making sure that proper assessment tools were in place.

Responses to Survey Statements 9 and 10 revealed the fact that teachers do feel they have received adequate training in the area of educational technology in order to implement and utilize computers effectively. Respondents also agreed that the Greeneville City School System had adequate assessment techniques in place in order to carefully monitor the overall effects of the educational technology program.

Recommendations

The Greeneville City School System should conduct more teacher oriented surveys. The information gathered in this survey was very valuable and can be used in many ways to improve the educational technology program. This information also justified and reinforced the vast

financial commitment and the tremendous efforts put forth by various school system staff to build and maintain the computer network. The survey was very informative and should provide a high level of confidence in the educational technology program for school administrators, school board members, parents, and other community members.

Teachers have the greatest potential to positively influence the lives of students during the school day. However, public education entities often fail to acknowledge this fact, and they do not seek the opinions and attitudes of teachers before beginning a new initiative or placing new emphasis on an existing one. Survey Statement 4 responses indicated that the school system needs to concentrate on the issue of teacher training in order to assist teachers as they struggle with classroom management issues. Even though the Greeneville City School System has made tremendous efforts to provide adequate teacher training opportunities, obviously there have not been enough. The System should conduct another survey with a concentration on training issues. The System should ask teachers what types of training they need, what are the best times for them to attend training, and how they would like the training sessions structured. The responses to Survey Statement 4 presented data that were consistent with the fact that teachers do need additional training in order to efficiently and effectively utilize five computers in a classroom with 20 or more students. With a quality educational technology program already in place, a new focus on teacher training could facilitate the opportunity to take the Greeneville City Schools to a higher technological level and could assist the efforts of the school system personnel to be "champions for children."

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APPENDIX A
Survey Cover Letter

Beverly S. Miller

175 Sequoia Trail
Greeneville, TN 37743

January 26, 2000

Dear Respondent:

I am presently enrolled in the Professional Studies Program at Tusculum College. As part of my graduation requirements, I am conducting a survey in order to collect data for my research project. My research project is titled, "Opinions of Teachers Regarding the Effects of Educational Technology in the Elementary Classroom." I am surveying all elementary school teachers currently employed by the Greeneville City School System.

The enclosed questionnaire has been designed so that you can complete it very quickly and easily. It should not take more than five minutes to complete. A pre-addressed envelope is included so that you may return the completed survey to me via inter-office mail.

Please be assured that the information you give me will be held strictly confidential and no individual data will be represented in my report. Your answers will be combined with the other responses and will be used only for statistical analysis.

It is extremely important that I get a large number of responses in order to present valid and reliable data for my project. I also truly value your opinions and will use the data to attempt to improve our educational technology program. I do appreciate your candid answers.

Please complete the enclosed survey form and return it to me in the envelope provided. In order to complete my project in a timely manner, I need your survey back no later than September 10, 1999. Thank you so much for your time and assistance.

Sincerely,

Beverly S. Miller

APPENDIX B Questionnaire

- A. What grade(s) do you currently teach? _____
- B. List number of years you have been teaching at the elementary level. _____
- C. List number of years you have been teaching in the Greeneville City School System.

Please pick a number from the scale to show how much you agree or disagree with each statement and write the number in the space to the right of the statement.

Scale

- | | |
|---|--------------------------|
| 1 | Strongly agree |
| 2 | Agree |
| 3 | Neutral |
| 4 | Disagree |
| 5 | Strongly disagree |

- | | |
|---|-------|
| 1. Educational technology has had a positive influence on my instructional methods
..... | _____ |
| 2. My students enjoy using the computers in the classroom..... | _____ |
| 3. The computers and the CCC software have been valuable tools in providing more individualized instruction to my students..... | _____ |
| 4. I have had a difficult time managing technology with only five computers in my classroom..... | _____ |
| 5. I can identify students who have become more successful because of the educational technology available in my classroom | _____ |
| 6. I have fewer behavior problems from my students while they are actively involved with the computers | _____ |
| 7. I have seen students gain greater self-confidence and self-esteem as a result of utilizing computer technology..... | _____ |
| 8. My students' test scores have improved as a result of utilizing the computers to deliver individualized lessons | _____ |
| 9. I feel that I have received adequate training in the area of educational technology in order to use it effectively in my classroom | _____ |
| 10. I feel there are adequate assessment instruments in place in order to measure how well we are using computer technology in our system | _____ |